



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|------------------------|------------------|
| 10/529,532 | 03/29/2005 | Luigi Resconi | FE 6056 (US) | 4560 |
| 34872 | 7590 | 02/20/2008 | | |
| Basell USA Inc. Delaware Corporate Center II 2 Righter Parkway, Suite #300 Wilmington, DE 19803 | | | EXAMINER LET, RIP A | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1796 | |
| | | | MAIL DATE | DELIVERY MODE |
| | | | 02/20/2008 PAPER | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/529,532

Applicant(s)

RESCONI ET AL.

Examiner

RIP A. LEE

Art Unit

1796

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 13 and 14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 13, and 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S5108)
Paper No(s)/Mail Date 11-30-2007
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Art Unit: 1796

DETAILED ACTION

This office action follows a response filed on November 30, 2007. Claim 1 was amended. Claims 1-3, 13, and 14 remain pending.

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1-3 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bingel *et al.* (WO 98/40331; equivalent U.S. 6,492,539 relied upon for indexing) in view of Galimberti *et al.* (U.S. 5,565,533).

Bingel *et al.* discloses a group 4 metallocene of general formula VI in claim 10. Salient features include a silyl bridged *bis*indenyl ligand framework in which R¹ is Me, Et, *i*-Pr, *n*-Bu, *sec*-Bu, R³ is 4-*t*-BuPh, and R¹¹ is Me₂Si, Ph₂Si, (Me)PhSi. Thus, compounds of type Me₂Si(2-R-4-(*t*-BuPh)Ind)₂ZrCl₂ are fully disclosed in the prior art. Compounds, when combined with aluminoxanes are useful for making olefin polymerization catalysts (col. 59, lines 23-col. 60, line 27). Inventive catalysts are useful for preparation of a variety of polyolefin products, and especially useful for copolymerizing ethylene with acyclic olefins of 3-20 carbon atoms and/or dienes such as 1,3-butadiene or 1,4-hexadiene (col. 58, lines 50-55). However, Bingel *et al.* does not elucidate further the details to carry out this type of polymerization.

Galimberti *et al.* teaches such a process, in which similar, group 4 *bis*indenyl metallocenes are used for preparation of ethylene/butene/polyene terpolymer wherein the polymer contains 35-90 mole % of units derived from ethylene, 5-64 mole % of units derived from 1-butene, and up to 5 mole % of units derived from polyene (col. 4, lines 45-51). Polymers are prepared by solution (slurry) polymerization in a steel autoclave by injecting catalyst solution therein followed by introducing monomer mixture (col. 10, lines 1-17).

Art Unit: 1796

The combination of references would have suggested to one having ordinary skill in the art that ethylene/butene/polyene terpolymer is readily prepared using the process of Galimberti *et al.* and catalysts containing the compounds of Bingel *et al.* Therefore, it would have been obvious to one having ordinary skill in the art to make catalysts containing the metallocenes of Bingel *et al.* and carry out polymerization as per Galimberti *et al.* in order to make ethylene/butene/polyene terpolymer. The combination is obvious because Bingel *et al.* contemplates preparation of this type of product, and Galimberti *et al.* provides the necessary steps to carry out such a process. And since Galimberti *et al.* teaches that the process is a general one which may be used with a variety of metallocene catalysts, one having ordinary skill in the art would have expected such a combination to work with a high degree of success.

3. Claims 1-3, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bingel *et al.* (WO 98/40331; equivalent U.S. 6,492,539 relied upon for indexing) in view of Resconi *et al.* (U.S. 5,585,448).

Bingel *et al.* discloses a group 4 metallocene of general formula VI in claim 10. Salient features include a silyl bridged *bisindenyl* ligand framework in which R¹ is Me, Et, *i*Pr, *n*-Bu, *sec*-Bu, R³ is 4-*t*-BuPh, and R¹¹ is Me₂Si, Ph₂Si, (Me)PhSi. Thus, compounds of type Me₂Si(2-R-4-(*t*-BuPh)Ind)₂ZrCl₂ are fully disclosed in the prior art. Compounds, when combined with aluminoxanes are useful for making olefin polymerization catalysts (col. 59, lines 23-col. 60, line 27). Inventive catalysts are useful for preparation of a variety of polyolefin products, and especially useful for copolymerizing ethylene with acyclic olefins of 3-20 carbon atoms and/or dienes such as 1,3-butadiene or 1,4-hexadiene (col. 58, lines 50-55). However, Bingel *et al.* does not elucidate further the details to carry out this type of polymerization.

Resconi *et al.* teaches such a process, in which similar, group 4 *bisindenyl* metallocenes are used for preparation of LLDPE copolymer wherein the copolymer contains 5-15 mole % of comonomer selected from 1-butene, 1-pentene, 1-hexene, and 1-octene (col. 6, lines 59-64) as well as ethylene/ α -olefin elastomer containing 40-80 mole % of units derived from ethylene, from 0.1 to 5 mole % of units derived from non-conjugated diolefin, and the complement being constituted by α olefins such as 1-butene, 1-hexene, or 4-methyl-1-pentene (col. 7, lines 17-

Art Unit: 1796

35). Polymers are prepared by solution polymerization in a steel autoclave by injecting catalyst solution therein followed by introducing monomer mixture (col. 6, line 57-col. 13, line 10).

The combination of art would have suggested to one having ordinary skill in the art that ethylene/ α -olefin copolymers and elastomers are readily using the process of Resconi *et al.* and catalysts containing the compounds of Bingel *et al.* Therefore, it would have been obvious to one having ordinary skill in the art to make catalysts containing the metallocenes of Bingel *et al.* and carry out polymerization as per Resconi *et al.* in order to make ethylene/butene/diene terpolymer. The combination is obvious because Bingel *et al.* contemplates preparation of this type of product, and Resconi *et al.* provides the necessary steps to carry out such a process. And since Resconi *et al.* teaches that the process is a general one which may be used with a variety of metallocene catalysts, one having ordinary skill in the art would have expected such a combination to work with a high degree of success.

Response to Arguments

4. The rejection of claims over Bingel *et al.* (WO 98/40416; U.S. 6,444,606), set forth in the previous office action dated May 29, 2005, has been overcome by amendment. Present claims are drawn to a process carried out in the presence of a non-supported catalyst system. In contrast, catalysts of the prior art are necessarily supported. The reference does not teach the process of the instant claims, and one having ordinary skill in the art would not have found it obvious to modify the process of the prior art.

Art Unit: 1796

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu S. Jagannathan, can be reached at (571)272-1119. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

/Rip A. Lee/
Examiner, Art Unit 1796

February 15, 2008